CLAIMS

1. A method of treating a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding full-length TrkB or any mutant, variant, homolog, or fragment thereof having the same activity as said full-length TrkB, whereby said amount of said isolated nucleic acid is sufficient to increase the amount of full-length TrkB in neurons compared to untreated neurons.

2. The method of Claim 1, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

3. The method of Claim 1, wherein said neuro-degenerative disorder or said neuro-developmental disorder is associated with an injury to the central or peripheral nervous system.

4. The method of Claim 3, wherein said injury is the result of stroke, cerebral ischemia, or chemical and/or physical trauma.

5. A method of preventing a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding full-length TrkB or any mutant, variant, homolog, or fragment thereof

having the same activity as said full-length TrkB, whereby said amount of said isolated nucleic acid is sufficient to increase the amount of full-length TrkB in neurons compared to untreated neurons.

6. The method of Claim 5, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

7. A method of treating a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding anti-sense RNA for a truncated TrkB isoform, whereby said amount of said isolated nucleic acid is sufficient to decrease the amount of truncated TrkB in neurons compared to untreated neurons.

8. The method of Claim 7, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

9. The method of Claim 7, wherein said neuro-degenerative disorder or said neuro-developmental disorder is associated with an injury to the central or peripheral nervous system.

10. The method of Claim 9, wherein said injury is the result of stroke, cerebral ischemia, or chemical and/or physical trauma.

11. A method of preventing a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding anti-sense RNA for a truncated TrkB isoform, whereby said amount of said isolated nucleic acid is sufficient to decrease the amount of truncated TrkB in neurons compared to untreated neurons.

12. The method of Claim 11, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

13. A method of inhibiting the progression of a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising

administering an amount of a vector to said mammal whereby said amount of said vector is sufficient to alter the ratio of amount of full-length TrkB polypeptide to truncated TrkB polypeptide in a neuron, and whereby said vector comprises an isolated nucleic acid.

14. The method of Claim 13, wherein said isolated nucleic acid is selected from the group consisting of an isolated nucleic acid encoding for full-length TrkB, an isolated nucleic acid encoding for anti-sense RNA for truncated

TrkB, and isolated nucleic acid encoding for full-length TrkB and for anti-sense RNA for truncated TrkB.

15. The method of Claim 13, wherein said vector is selected from the group consisting of a virus and a plasmid.

16. The method of Claim 15, wherein said virus is selected from the group consisting of a herpesvirus, adenovirus, adeno associated virus, retrovirus, vacccinia virus, and canary pox virus.

17. A method for treating a disease in a mammal characterized by an increased ratio of the amount of truncated TrkB polypeptides to the amount of full-length TrkB polypeptide in a cell as compared to said ratio in a healthy mammal, said method comprising

administering an amount of a vector to said mammal whereby said amount of said vector is sufficient to alter said ratio of amount of truncated TrkB polypeptide to the amount of full-length TrkB polypeptide in said cell, and whereby said vector comprises an isolated nucleic acid.

18. The method of Claim 17, wherein said isolated nucleic acid is selected from the group consisting of an isolated nucleic acid encoding for full-length TrkB, an isolated nucleic acid encoding for anti-sense RNA for truncated TrkB, and isolated nucleic acid encoding for full-length TrkB and for anti-sense RNA for truncated TrkB.

19. The method of Claim 17, wherein said vector is selected from the group consisting of a virus and a plasmid.

20. The method of Claim 19, wherein said virus is selected from the group consisting of a herpesvirus, adenovirus, adeno associated virus, retrovirus, vacccinia virus, and canary pox virus.

21. A method of treating a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding full-length TrkC or any mutant, variant, homolog, or fragment thereof having the same activity as said full-length TrkC, whereby said amount of said isolated nucleic acid is sufficient to increase the amount of full-length TrkC in neurons compared to untreated neurons.

22. The method of Claim 21, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

23. The method of Claim 21, wherein said neuro-degenerative disorder or said neuro-developmental disorder is associated with an injury to the central or peripheral nervous system.

24. The method of Claim 23, wherein said injury is the result of stroke, cerebral ischemia, or chemical and/or physical trauma.

25. A method of preventing a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding full-length TrkC or any mutant, variant, homolog, or fragment thereof having the same activity as said full-length TrkC, whereby said amount of said isolated nucleic acid is sufficient to increase the amount of full-length TrkC in neurons compared to untreated neurons.

26. The method of Claim 25, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

27. A method of treating a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding anti-sense RNA for a truncated TrkC isoform, whereby said amount of said isolated nucleic acid is sufficient to decrease the amount of truncated TrkC in neurons compared to untreated neurons.

28. The method of Claim 27, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

29. The method of Claim 27, wherein said neuro-degenerative disorder or said neuro-developmental disorder is associated with an injury to the central or peripheral nervous system.

30. The method of Claim 27, wherein said injury is the result of stroke, cerebral ischemia, or chemical and/or physical trauma.

31. A method of preventing a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising:

administering to said mammal an amount of an isolated nucleic acid encoding anti-sense RNA for a truncated TrkC isoform, whereby said amount of said isolated nucleic acid is sufficient to decrease the amount of truncated TrkC in neurons compared to untreated neurons.

32. The method of Claim 31, wherein said neuro-degenerative disorder or said neuro-developmental disorder is selected from the group consisting of Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis (Lou Gehrig's disease), the adverse neurologic complications of Down syndrome, diabetic peripheral neuropathy and other types of peripheral neuropathy.

33. A method of inhibiting the progression of a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising

administering an amount of a vector to said mammal whereby said amount of said vector is sufficient to alter the ratio of amount of full-length TrkC polypeptide to truncated TrkC polypeptide in a neuron, and whereby said vector comprises an isolated nucleic acid.

34. The method of Claim 33, wherein said isolated nucleic acid is selected from the group consisting of an isolated nucleic acid encoding for full-length TrkC, an isolated nucleic acid encoding for anti-sense RNA for truncated TrkC, and isolated nucleic acid encoding for full-length TrkC and for anti-sense RNA for truncated TrkC.

35. The method of Claim 33, wherein said vector is selected from the group consisting of a virus and a plasmid.

36. The method of Claim 35, wherein said virus is selected from the group consisting of a herpesvirus, adenovirus, adeno associated virus, retrovirus, vacccinia virus, and canary pox virus.

37. A method for treating a disease in a mammal characterized by an increased ratio of the amount of truncated TrkC polypeptides to the amount of full-length TrkC polypeptide in a cell as compared to said ratio in a healthy mammal, said method comprising

administering an amount of a vector to said mammal whereby said amount of said vector is sufficient to alter said ratio of amount of truncated TrkC polypeptide to the amount of full-length TrkC polypeptide in said cell, and whereby said vector comprises an isolated nucleic acid.

38. The method of Claim 37, wherein said isolated nucleic acid is selected from the group consisting of an isolated nucleic acid encoding for full-length TrkC, an isolated nucleic acid encoding for anti-sense RNA for truncated TrkC, and isolated nucleic acid encoding for full-length TrkC and for anti-sense RNA for truncated TrkC.

39. The method of Claim 37, wherein said vector is selected from the group consisting of a virus and a plasmid.

40. The method of Claim 39, wherein said virus is selected from the group consisting of a herpesvirus, adenovirus, adeno associated virus, retrovirus, vacccinia virus, and canary pox virus.

41. A method of inhibiting the progression of a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising

administering an amount of a polypeptide encoded by a nucleic acid encoding full-length TrkB, or any mutant, variant, homolog, or fragment thereof having the same activity as full-length TrkB, whereby said amount of said polypeptide increases the amount of full-length TrkB in a neuron.

42. The method of Claim 41, further comprising administering a neurotrophin to said mammal.

43. A method of inhibiting the progression of a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising

administering an amount of a polypeptide encoded by a nucleic acid encoding full-length TrkC, or any mutant, variant, homolog, or fragment thereof having the same activity as full-length TrkC, whereby said amount of said polypeptide increases the amount of full-length TrkC in a neuron.

44. The method of Claim 43, further comprising administering a neurotrophin to said mammal.

45. A method of inhibiting the progression of a neuro-degenerative disorder or a neuro-developmental disorder in a mammal, said method comprising

administering an amount of the combination of a first polypeptide encoded by a nucleic acid encoding full-length TrkB, or any mutant, variant, homolog, or fragment thereof having the same activity as full-length TrkB, whereby said amount of said first polypeptide increases the amount of full-length TrkB in a neuron and a second polypeptide encoded by a nucleic acid encoding full-length TrkC, or any mutant, variant, homolog, or fragment thereof having the same activity as full-length TrkC, whereby said amount of said second polypeptide increases the amount of full-length TrkC in a neuron.

46. The method of Claim 45, further comprising administering a neurotrophin to said mammal.

47. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for full-length TrkB polypeptide wherein said full-length TrkB polypeptide has the sequence in SEQ ID NO: 2; and

a pharmaceutically acceptable carrier.

48. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for full-length TrkC polypeptide wherein said full-length TrkC polypeptide has the sequence in SEQ ID NO: 10; and

a pharmaceutically acceptable carrier.

49. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for anti-sense RNA specific for a truncated TrkB isoform; and

a pharmaceutically acceptable carrier.

50. The pharmaceutical composition of Claim 49 wherein said polynucleotide has the sequence selected from the group comprising SEQ ID NO: 19, and SEQ ID NO: 20.

51. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for anti-sense RNA specific for a truncated TrkC isoform; and

a pharmaceutically acceptable carrier.

52. The pharmaceutical composition of Claim 51 wherein said polynucleotide has the sequence selected from the group comprising SEQ ID NO: 21, and SEQ ID NO: 22.

53. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for double-stranded RNA specific for a truncated TrkB isoform; and

a pharmaceutically acceptable carrier.

54. A pharmaceutical composition comprising

a vector comprised of polynucleotide encoding for double-stranded RNA specific for a truncated TrkC isoform; and

a pharmaceutically acceptable carrier.